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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,544	02/05/2004	Maki Hoshino	040302-0379	2816

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EXAMINER

STADLER, REBECCA M

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/771,544	Applicant(s) HOSHINO, MAKI	
	Examiner Rebecca M. Stadler	Art Unit 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/5/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

Response to Arguments

Applicant's arguments filed 2/28/2006 have been fully considered but they are not persuasive. The term "monolithic" is clear in light of page 13, lines 1-20 of the specification. However, it is still unclear as to how one would calculate the volume for a solid with many holes in it.

Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.


Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a.) Claim 8 is unclear regarding the phrase "2 grams or less per liter of the monolithic catalyst." It is unclear as to how the volume of the solid is calculated. For example, how would one calculate the volume for a solid with many holes in it?

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2-5, 8, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over USP 6,548,034 to Takamura in view of USP 5,364,984 to Arntz.

As to claims 1 and 12, Takamura '034 teaches a method of reducing the carbon monoxide concentration of a mixed gas containing hydrogen, carbon monoxide and oxygen (see column 4, lines 4-13). The method provides a carbon monoxide concentration reducing catalyst, which has a transition metal element (see column 4, lines 7-9) and the mixed gas supplied to the catalyst is at a gas hourly space velocity of 100 – 100,000 [1/h] (see column 4, lines 59-62) with a reaction temperature in the range of 40°C to 200°C.

Takamura '034 does not disclose a carbon monoxide adsorption amount from 0.1 to 3mL/cat.g. However, Arntz '984 discloses a platinum metal with a carbon monoxide adsorption amount of from 0.5 to 1.6 ml of CO/g of catalyst (see column 3, lines 50-55, column 6, lines 5-9, and claim 4, column 10, lines 3-7). It would have been obvious to one of ordinary skill in the art to use the carbon monoxide reduction catalyst of Arntz in the Takamura process because Arntz teaches that this amount of carbon monoxide reduction is desirable.

As to claim 2, the Takamura '034 process provides a feed stream whereby the carbon monoxide concentration is about 1 mol% (see column 5, lines 33-36), which falls into the claimed range of 0.1 to 2 vol%. The oxygen concentration in the mixed gas is 0.5 to 4 times the carbon monoxide concentration (see column 4, lines 55-57), which also falls into the claimed range of 0.5 to 1.5 molar times the carbon monoxide concentration.

As to claim 3, Takamura '034 discloses that the carbon monoxide reducing catalyst contains comprises platinum and at least one metal selected from cobalt, nickel, copper or manganese (see column 5, lines 6-9). Takamura discloses a broad range of amounts for the first and second component (see column 4, lines 45-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the amount of the second component of the catalyst, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. See, e.g., In re Boesch, 617 F.2d 272, 205 U.S.P.Q. 215 (CCPA 1980). The artisan would have been motivated to vary the amount of the second component of the catalyst by the reasoned explanation that varying the second component would optimize the amount of carbon monoxide adsorbed, while reducing the cost of the catalyst.

As to claims 4 and 5, Takamura discloses that the second component of the catalyst is a noble metal, which is platinum (see column 5, lines 13-14). As to the claimed ruthenium, comparative example 3 in column 8 of Takamura teaches that ruthenium can be used as a carbon monoxide oxidation catalyst.

As to claim 8, in Takamura '034, the carbon monoxide reducing catalyst is a monolithic catalyst (see example 2 in column 8, and column 4, lines 4-37 showing a supported catalyst). The amount of the second component appears to fall within the range of 2g or less per liter of the monolithic catalyst (see column 4, lines 45-49, as compared to example 1 in the present invention disclosure).

As to claim 9, the mixed gas supply in the Takamura '034 process is reformed gas obtained by reforming a fuel containing a hydrocarbon (see column 3, lines 41-44).

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura '034 taken with Arntz '984 as applied to claim 3 above, and further in view of USP 6,913,739 to Shore.

As to claims 6 and 7, Takamura '034 does not teach that the second component is a rare earth metal. Shore '739 does teach the use of a rare earth metal as a component of the catalyst (see column 3, lines 57-61). Shore '739 further discloses that the rare earth metal can be lanthanum, cerium, neodymium, and praseodymium (see column 5, line 64 – column 6, line 5). As cerium (and other rare earth metals) are known to be effective, yet less expensive preferential oxidation catalysts (see column 3, lines 11-16), it would have been obvious to one of ordinary skill in the art to combine the rare earth metal catalyst component of Shore '739 with the catalyst composition of Takamura '034 in order to reduce the carbon monoxide composition in a gas stream effectively with reduced cost. It is further noted that when A is known (transition metal) and B (rare earth metal) is known to perform a function (carbon monoxide oxidation), then A and B together is obvious. See, e.g., In re Kerkhoven, 205 U.S.P.Q. 1069 (CCPA 1980).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura '034 taken with Arntz '984 as applied to claim 1 above, and further in view of USP 3,584,608 to Shibagaki.

As to claim 10, Takamura '034 teaches that the carbon monoxide containing gas can be supplied by a process for reforming hydrogen methanol, et cetera (see column 1, lines 11-15); therefore, Takamura '034 suggests that it does not matter where the detrimental carbon monoxide containing gas stream comes from. However, Takamura does not explicitly disclose reducing the carbon monoxide concentration from the exhaust stream of an internal combustion engine. Shibagaki discloses removing detrimental components such as carbon monoxide within the exhaust gas of an internal combustion engine (see column 1, lines 35 – 51). As such, it would have been obvious to one of ordinary skill in the art at the time of this invention to use the Takamura process to reduce the carbon monoxide concentration in a carbon monoxide containing gas stream from an internal combustion engine, as in Shibagaki, in order to remove these detrimental components as desired in both Takamura and Shibagaki.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rebecca M. Stadler whose telephone number is 571-272-5956.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

rms



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